INFIELD Safety UK Ltd
1210 Parkview
Arlington Business Park
Theale
Reading RG7 4TY

T: 011896 57899
F: 011896 57788
E: info@infield-safety.co.uk
W: www.infield-safety.de

A Signet Armorlite Group Company

Blindness separates us from things.
Deafness separates us from people.

Immanuel Kant

© 13.11.110.2 / effective from 04.2014
BERGER + PARTNER ☎ 0212-652265

Hearing Protection 2014

Contents

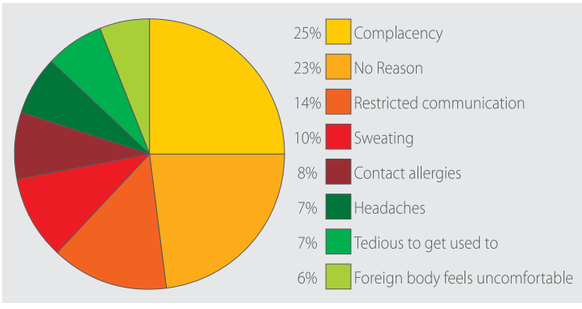
Topic	Page
Preface	3
Products	4 - 7
Products and special models	8 - 11
The Human ear	13
Hearing – How does it function?	14
When do we perceive something as loud?	14
Loss of hearing caused due to Noise, self-protection period	15
Frequency analysis	16
Laws and regulations	17
Hearing protection according to INFIELD measure	18
Moulding and Material	18
Advantages of INFIELD Otoplastics	18
Material, Maintenance, Service	19
Contact	20

Preface

Hearing damage caused due to noise is irreversible

When we sleep the entire body relaxes: the muscles, the eyes, the ears or at least, that is what we believe! However, our ears never sleep! How else can we explain how we can be awoken by noise? Be it a siren, the cry of a baby, our partner coughing or the alarm clock. All these sounds wake us. Most people are unaware of the health hazards caused by noise. Young people are particularly vulnerable to hearing damage as they tend to expose themselves to high volume levels at rock concerts, in the discos or while listening to their MP3 player with head phones. The established threshold for possible hearing damage is 85 decibels (dB), the pain threshold lies between 120 and 130 dB. That is the equivalent to the noise of a jet plane at a distance of 100 meters. In the home, decibel value prevails between 40 and 50 dB. In offices up to 65 dB. In traffic the decibel easily reaches 85 dB and Discos and Rock Concerts are around 110 dB and clearly louder than a jack hammer with 100 dB.

In the work place there are specific regulations as to when the wearing of hearing protection is mandatory. Often the hearing protectors that are provided are not worn. Why? The reason most often given is the hearing protectors are often uncomfortable and communications unclear. The result is a feeling of isolation. Some users complain of headaches, while others complain about material allergies or unpleasant sweating caused by the hearing protection.



Reasons for rejection of Hearing protectors

Individually customized hearing protection designed by INFIELD Safety is comfortable and reduces noise levels, without acoustically isolating the user from his or her environment.

Conventional Hearing protector

INFIELD Otoplastics

Phonor® Select

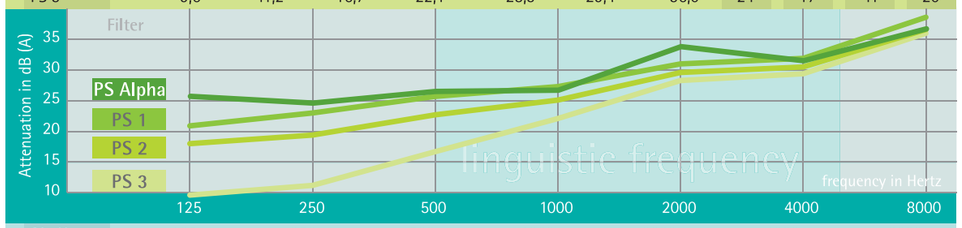
Otoplastic with Phonor® Select Filter

Phonor® Select Alpha, 1, 2 and 3 offer good protection across the entire frequency spectrum. Phonor® Select Filter has S-V-W- and E Entry (see page 17). Because of our many years of experience in the field of hearing protection, the Phonor® Select Filters were developed exclusively for INFIELD and are utilised across a wide range of industries.
All Phonor® products are made from soft Futuretec silicone 60 shore. They are also available in acrylic material (UV light curing material).

- Choice of 4 filters types.
- High quality manufacture for a perfect fit.
- Less attenuation at 4000Hz, for better communication.
- Filters are interchangeable without special tools.
- Easy cleaning of the earplugs by purging.
- All earplugs have a unique, laser etched serial number.
- No special cleaning agents required.
- Recommended period of usage: 5 years.
- Made in Germany.
- Available only from INFIELD Safety.

Attenuation Phonor® Select

f in Hz	125	250	500	1000	2000	4000	8000	H	M	L	SNR
Filter	M_f in dB										
PS Alpha	25,7	24,6	26,5	26,7	33,8	31,5	36,7	28	24	22	27
PS 1	21,2	23,3	26,0	27,6	31,3	32,2	38,9	28	24	21	27
PS 2	18,3	19,7	23,0	25,4	29,9	30,8	36,9	26	22	18	25
PS 3	9,6	11,2	16,7	22,1	28,3	29,4	36,0	24	17	11	20



f in Hz	125	250	500	1000	2000	4000	8000
Filter	S_f in dB						
PS Alpha	4,5	4,8	4,8	3,8	4,5	5,0	5,3
PS 1	5,1	4,5	4,3	3,7	3,4	3,0	5,8
PS 2	3,1	3,8	3,7	3,3	4,2	2,4	5,5
PS 3	4,5	2,8	3,1	3,0	4,7	3,2	5,4
Filter	APV 84 in dB						
PS Alpha	21,2	19,8	21,7	22,9	29,3	26,5	31,4
PS 1	16,1	18,8	21,7	23,9	27,9	29,2	33,1
PS 2	15,2	15,9	19,3	22,1	25,7	28,4	31,4
PS 3	5,1	8,4	13,6	19,1	23,5	26,2	30,6

Phonor® Select Digital

Phonor® Select Digital, 1, 2 and 3 offer good protection across the entire frequency spectrum. Phonor® Select Digital Filter has S-V-W- and E Entry (see page 17). Because of our many years of experience in the field of hearing protection, the Phonor® Select Digital Filters were developed exclusively for INFIELD and are utilised across a wide range of industries.
All Phonor products are made from acrylic material (UV light curing material).

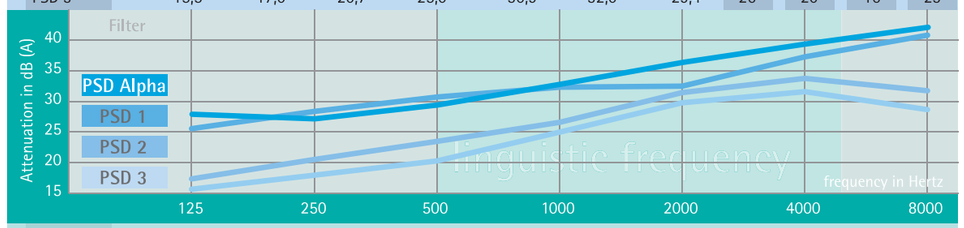
- Choice of 4 filters types.
- Manufactured with rapid prototyping process
- Otoplastics can be reproduced at any time
- Filters are interchangeable without special tools.
- Easy cleaning of the earplugs by purging.
- Unique Laser etched serial number.
- Dust resistant.
- Recommended period of usage: 4 years.
- Made in Germany.
- Available only from INFIELD Safety.

Otoplastic with Phonor® Select Filter Digital

NEW!

Attenuation Phonor® Select Digital

f in Hz	125	250	500	1000	2000	4000	8000	H	M	L	SNR
Filter	M_f in dB										
PSD Alpha	27,6	27,5	29,7	33,2	35,5	39,5	43,4	32	28	25	31
PSD 1	25,5	27,6	30,5	33,5	33,0	38,5	41,4	31	30	26	32
PSD 2	17,8	20,7	24,2	27,0	32,6	34,3	32,3	27	23	19	26
PSD 3	15,5	17,0	20,7	25,0	30,9	32,0	29,4	26	20	16	23



f in Hz	125	250	500	1000	2000	4000	8000
Filter	S_f in dB						
PSD Alpha	4,0	6,1	4,6	3,1	5,2	3,4	3,8
PSD 1	2,6	3,3	3,1	2,5	3,7	3,4	4,7
PSD 2	4,5	3,5	3,8	4,1	4,4	3,1	7,5
PSD 3	5,1	3,7	3,6	3,5	4,2	4,2	6,0
Filter	APV 84 in dB						
PSD Alpha	23,6	21,4	25,1	30,1	30,3	36,1	39,6
PSD 1	22,9	24,3	27,4	31,0	29,3	35,1	36,7
PSD 2	13,3	17,2	20,4	22,9	28,2	31,2	24,8
PSD 3	10,4	13,3	17,1	21,5	26,7	27,8	23,4

ER Work

ER Work

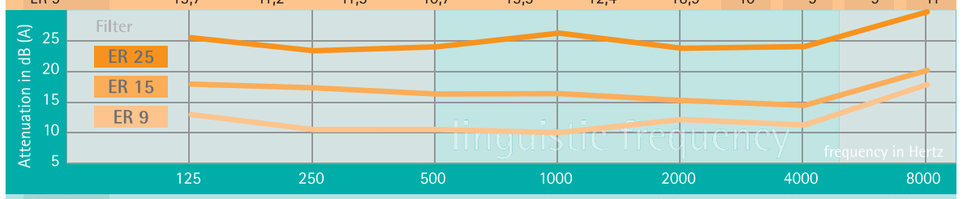
The new ER Work combines the practical advantages of Phonor® Select range and the linear insulation of the ER Music filter. It is particularly suited for forklift truck drivers, people who have a lot of phone calls or work with a walkie-talkies. Workstations where machines / engines are monitored and where discernment of machine / engine tone is important.
The 3 filters within the group; ER 9, 15 and 25 have linear attenuation over the entire frequency range, offering excellent speech understanding and perception. The ER 15 filter meets the criteria for the S, V, W and E mark. (See page 17).

- Choice of 3 filters.
- Filters have linear attenuation.
- True sound is perceived.
- Very good communication clarity
- Recommended period of usage: 5 years
- Made in Germany
- Unique, laser etched serial numbers.

NEW!

Attenuation ER Work

f in Hz	125	250	500	1000	2000	4000	8000	H	M	L	SNR
Filter	M_f in dB										
ER 25	25,2	24,1	24,8	25,5	24,2	24,1	29,9	21	22	21	23
ER 15	18,6	17,6	16,5	16,5	15,0	14,6	20,6	13	13	14	15
ER 9*	13,7	11,2	11,3	10,7	13,3	12,4	18,9	10	9	9	11



f in Hz	125	250	500	1000	2000	4000	8000
Filter	S_f in dB						
ER 25	3,7	4,0	3,8	2,8	3,4	3,7	5,7
ER 15	5,5	3,7	2,9	2,5	2,6	2,1	4,0
ER 9*	3,2	2,6	3,2	2,0	3,5	2,3	5,1
Filter	APV 84 in dB						
ER 25	21,5	20,1	21,0	22,7	20,8	20,4	24,2
ER 15	13,1	13,9	13,6	14,0	12,4	12,5	16,6
ER 9*	10,5	8,6	8,1	8,7	9,8	10,1	13,8

* RC 9: at 500 Hz and 4000 Hz, the APV84 is lower than the minimum required attenuation with regards to EN 352-2, i.e. the standard CE does not apply.

ER Music

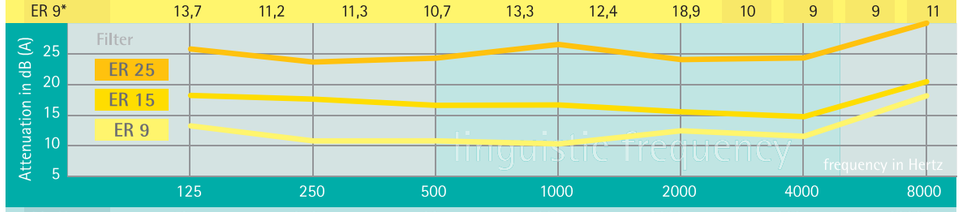
The ER 9, 15 and 25 filters have been developed for musicians. They absorb sound across all frequencies without significant tone change. The filters satisfy the S-V-W and E descriptions (see page 17).
ER is also ideal for pilots and persons who regularly attend concerts or clubs.

- Choice of 3 filters.
- Filters have linear attenuation.
- True sound is perceived.
- Very good communication clarity
- Perfect for Musicians
- Compatible with in-ear monitoring and mobile phone headsets.
- Recommended period of usage: 5 years
- Made in Germany
- Unique, laser etched serial numbers.

ER Music

Attenuation ER Music

f in Hz	125	250	500	1000	2000	4000	8000	H	M	L	SNR
Filter	M_f in dB										
ER 25	25,2	24,1	24,8	25,5	24,2	24,1	29,9	21	22	21	23
ER 15	18,6	17,6	16,5	16,5	15,0	14,6	20,6	13	13	14	15
ER 9*	13,7	11,2	11,3	10,7	13,3	12,4	18,9	10	9	9	11



f in Hz	125	250	500	1000	2000	4000	8000
Filter	S_f in dB						
ER 25	3,7	4,0	3,8	2,8	3,4	3,7	5,7
ER 15	5,5	3,7	2,9	2,5	2,6	2,1	4,0
ER 9*	3,2	2,6	3,2	2,0	3,5	2,3	5,1
Filtro	APV 84 in dB						
ER 25	21,5	20,1	21,0	22,7	20,8	20,4	24,2
ER 15	13,1	13,9	13,6	14,0	12,4	12,5	16,6
ER 9*	10,5	8,6	8,1	8,7	9,8	10,1	13,8

* RC 9: at 500 Hz and 4000 Hz, the APV84 is lower than the minimum required attenuation with regards to EN 352-2, i.e. the standard CE does not apply.

biem ER - Custom made head phones

Is it possible to combine sound, protection and lifestyle in one product?

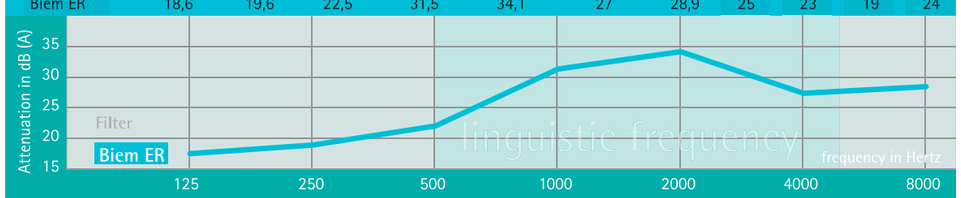
Yes. High quality materials and the latest electronic technologies allow INFIELD to create a custom made combination of protection and headphones specially designed for you.
Suitable for making phone calls, listen to music and communication.
BIEM ER is suitable for any ER hearing protection worldwide. Simply remove the filter from the earplugs – insert the headphones – enjoy your music, phone or other communications device that accepts a 3.5mm jack plug.

BIEM ER and original INFIELD ER Hearing Protection
The ideal combination of custom made headphones and custom made hearing protection. Available in transparent, yellow, red or blue.

Technical Details:
- Impedance 18 ohm+/-10%
- Echo: 110dB+/-3
- 20 Hz-20KHz
- Aluminium case
- Weather proof protection
- Tested as per DIN 352-2 and 352-6 for communication cable
- Kink proof cable with integrated microphone.
- Switch for On / Off as well as receiving calls
- Stereo cable – 3.5mm jack plug.

Attenuation Biem ER

f in Hz	125	250	500	1000	2000	4000	8000	H	M	L	SNR
Filter	M_f in dB										
Biem ER	18,6	19,6	22,5	31,5	34,1	27	28,9	25	23	19	24



f in Hz	125	250	500	1000	2000	4000	8000
Filter	S_f in dB						
Biem ER	3	2,9	4,4	4,1	4,8	3,2	8,1
Filter	APV 84 in dB						
Biem ER	15,6	16,7	18,1	27,4	29,3	23,8	20,8

Shooter

Custom made Hearing protections for Shooters, Hunters and Industry.

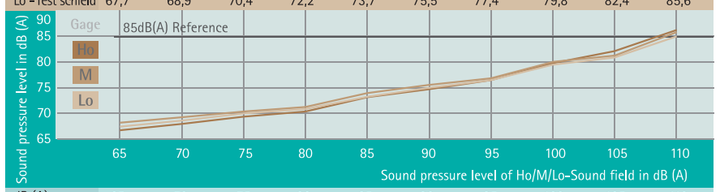
Electronics:
- Innovative filter electronics:
  reacting automatically to impulse and continual noise.
- Electronic, active hearing protection.
- Ideal for individual testing through modular structure
- Easy use buttons
- Battery size 10 (average battery life 70 hours)
- Unique laser etched serial numbers.
- Easy care by removing from the Otoplastic
  Warning: Electronic items should not be allowed to become wet.

Otoplastic:
- Full modular
- Sits securely and comfortably in the ear canal
- Made from super soft (60 shore) material.
- High density, easy to clean surface.

The Otoplastic can be combined with BIEM ER headphones and ER 9, 15 and 25 passive hearing protection filters giving extra functionality.
- Electrical active Hearing Protector (Shooter)
- Passive hearing protector (ER 9, 15 or 25)
- Communication and music (BIEM)

Shooter

dB (A)	65	70	75	80	85	90	95	100	105	110
Gage	Average value in dB									
Ho-Test schield	67,0	68,2	69,9	71,5	73,2	75,1	77,4	80,1	83,3	86,9
M -Test schield	68,1	69,5	71,1	72,7	74,2	76,0	77,9	80,2	82,9	86,2
Lo -Test schield	67,7	68,9	70,4	72,2	73,7	75,5	77,4	79,8	82,4	85,6



dB (A)	65	70	75	80	85	90	95	100	105	110
Gage	Standard deviation in dB									
Ho-Test schield	4,6	4,6	4,4	4,2	3,9	3,4	2,8	2,3	2,2	2,2
M -Test schield	4,8	4,7	4,6	4,4	4,2	3,9	3,4	2,7	2,0	1,5
Lo -Test schield	4,7	4,8	4,7	4,4	4,2	3,9	3,3	2,6	1,9	1,2

Average value and Standard deviation of
A-rated equivalent diffuse schield – Sound pressure level

Sleepfit

The Sleepfit is designed to fit particularly flat to the ear. Making it very comfortable whilst in the lying position, such as sleeping. It is designed as a sleeping aid for shift workers or those who have disturbed sleep due a partners snoring. It is also ideally suited for persons who wear full protective helmets, such as motorcyclists. The Sleepfit is coloured yellow as standard. Other colours are available on request.

Swim protection

Experience the joy of care free bathing and swimming without the discomfort of water entering your ears.

- Safety during bathing, swimming and shower
- For children and adults
- Individual custom made
- Buoyant, durable, tear proof, skin friendly and super soft silicon material
- easy to wear and remove through anatomically made grip
- easy to clean
- available in various respective colour combinations.

Please note that the swim protector does not provide any protection during diving.

Motor special

- Comfortable, custom fit protection.
- Clear discernment of warning signals and traffic noise
- Ideal for helmet wearers due to its extra small size.
- Fitted with the Phonor Select 1 filter, as standard.
- Other Phonor Select filters can also be used
- Tested according to DIN EN 352 – 2

Attenuation Phonor® Select

f in Hz	125	250	500	1000	2000	4000	8000	H	M	L	SNR
Filter	M_f in dB										
PS Alpha	25,7	24,6	26,5	26,7	33,8	31,5	36,7	28	24	22	27
PS 1	21,2	23,3	26,0	27,6	31,3	32,2	38,9	28	24	21	27
PS 2	18,3	19,7	23,0	25,4	29,9	30,8	36,9	26	22	18	25
PS 3	9,6	11,2	16,7	22,1	28,3	29,4	36,0	24	17	11	20

Delivery

INFIELD's scope of delivery always contains the following:
- Stable storage box
- Leather case for Otoplastic
- Cord inclusive of a Shirt – Clip (apart from ER music)
- Cleaning stick and Otofresh cream
- User's manual

Cleaning spray and tissues can be ordered as accessories. Upon request a personal instruction can also be made available by our sales representatives.

Scope of INFIELD Delivery

Leak test

There are various possibilities by which Otoplastic can be tested for leakage. The results speak mainly about the fit of the Otoplastic and less about the actual leakage of the filter.
While Leakage tests are mostly measured per ear (monaural) whereas the actual leakage is measured for both ears (binaural).

The ear - its anatomy

Outer ear
The outer ear is made up of the visible portion called the pinna and the ear canal. The human pinna's functions are of no great importance, whilst animals can move and turn their ears to locate sounds.

Middle ear
The middle ear consists of eardrum, tympanic cavity and Eustachian tube.

Inner ear
The inner ear is made up of the organ of Corti and the cochlea.

Ear canal
The ear canal links the outer ear and the eardrum. It is approximately 3-4cm in depth and 0.5-1cm in diameter. It is completely covered with skin. The outermost part of the ear canal near the pinna is supported by cartilage, the inner part by bone. In the section made up of cartilage sebaceous glands secrete the yellow cerumen which is expelled by tiny hairs.

Ear drum
Between the ear canal and the tympanic cavity lies the eardrum. This membrane is approximately 1cm in diameter and 0.1mm thick. On the inside of the eardrum is a mucous membrane. It appears grey and shiny from the outside.

Tympanic cavity
In the tympanic cavity there are the three ear bones or ossicles: Hammer, anvil and stirrup as well as the semicircular canals of the vestibular apparatus.

Hammer, anvil and stirrup
The hammer, anvil and stirrup are three tiny bones that are connected to each other. They directly couple and amplify sound energy from the eardrum to the inner ear.

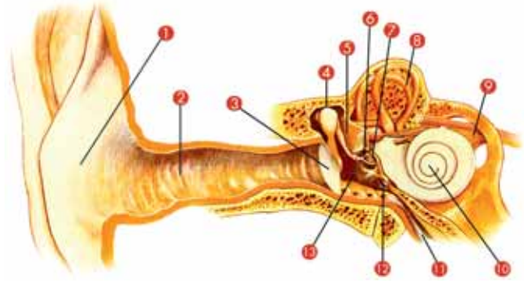
Oval window
Sound waves travel via this membrane from the ossicles to the inner ear. The inner ear is located in the cochlea, well protected by the petrous portion of the temporal bone ('pyramid').

Round window
The round window is positioned adjacent to the oval window and is the end point of the scala tympani.

Eustachian tube
The Eustachian tube links the tympanic cavity with the pharynx. Its main function is pressure equalisation in the ear.

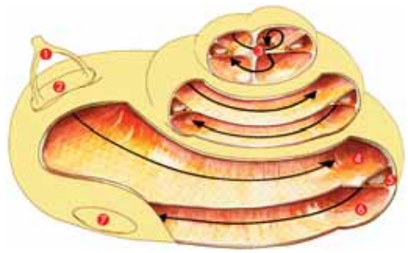
Cochlea
The cochlea has three ducts called scale: The scalavestibuli and the scala tympani, which both contain perilymph. Between these two is the scala media filled with endolymph which contains the organ of Corti. The word cochlea is the latin word for snail and comes from the shape of the organ.

Organ of Corti
Authentic Hearing Organ. The organ of Corti is the essential part of our hearing. It is located in the cochlea and contains 25,000 hair cells, each equipped with 100 hairs called stereocilia. These hairs are the sensory receptors of the auditory system and pass on information from sound waves via the auditory nerve to the brain.



Profile of the Ear
1. Outer ear
2. Ear canal
3. Ear drum
4. Hammer
5. Anvil
6. Stirrup
7. Oval window
8. Archway
9. Auditory nerve
10. Cochlea
11. Eustachian tube
12. Round window
13. Tympanic cavity

Hearing - how does it work?



Cochlea

1. Stirrup
2. Oval window
3. Helicotrema
4. Scala vestibule
5. Organ of Corti
6. Scala tympani
7. Round window

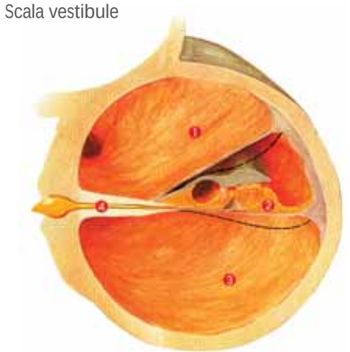
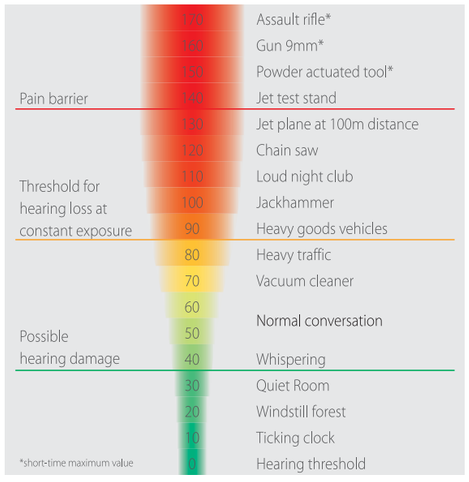


Diagram of the cochlea

1. Scala vestibule
2. Organ of Corti
3. Scala tympani
4. Auditory nerve

To be precise, the human ear doesn't process sounds, but sound waves that resonate the eardrum. The resonance is amplified by the Ossicles in the Tympanic Cavity and reaches the inner ear through the Oval Window, where the actual hearing process begins.
A very important factor in the hearing process is the frequency of sound. The unit of frequency is Hertz (Hz). Hertz is a measure of the number of sound waves per second. The amplification of sound by the Ossicles depends on the frequency. The best amplification of sound is achieved in the range of the human voice, between 1000 and 2000 Hz. When a sound wave reaches the Oval Window via the previously mentioned pathway, it is passed on via the Perilymph, inside the Scala vestibule, to trigger the Basilar Membrane. Depending on the frequency, sensory hairs in different locations on the Organ of Corti are triggered. An analogy would be waves breaking at specific points on the beach, depending on their size. This way we can distinguish between high and low pitches. From the Stereocilia the sound wave travels towards and resonates the Reissner's membrane. The membrane experiences a deflection by the incoming wave to the sensory filaments.
This resonance then triggers receptor cells which send an electric impulse along the auditory nerve to the brain. Here the sound is recognised and defined. For example as a note or a word. The ear responds 7 times faster than the eye. If we could see as fast as we can hear, we would see every single frame in TV broadcasts instead of fluid movements.

When do we perceive something as loud?

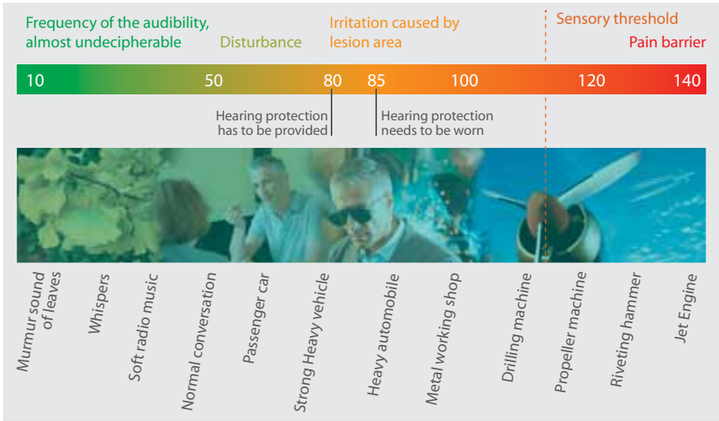


Every noise not only has a specific frequency but also a volume. Volume is measured in Decibel (dB) and the following graph shows us typical well known sounds with their respective Decibel level. Our pain threshold is around 120dB. Hence sound with a volume level above 120dB causes pain in our ears.
Should we need to maintain a distance of approx.1m in order to have a normal conversation, the background noise level could be up to 80dB. In such environments, one should not stay long without wearing hearing protection.

on the left: Examples of various volumes in decibels

Possible damages

Continuous exposure to high noise levels causes hearing loss that is irreversible in 95% of cases.
Very often our bodies show symptoms that are not obviously linked with noise, like insomnia, poor concentration and cardiovascular disease.
If you suffer from any of these complaints, it is advisable that your surroundings are analysed for noise. In case that source of dangerous noise levels have been identified and cannot be eliminated, hearing protection must be worn.
Find more conditions associated with high noise levels in the following paragraphs.



Damages for the ear

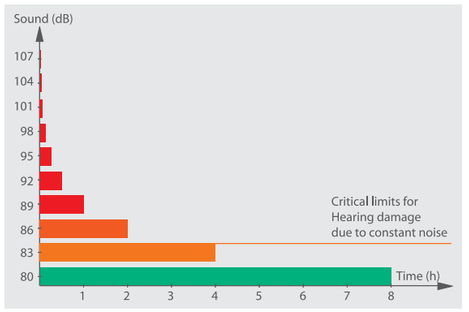
Sensorineural hearing loss.
Loud noises destroy the hair cells in the Organ of Corti and can cause partial or complete loss of hearing.

Tinnitus (lat.: Tinkle)
Around 3 Million people suffer from Tinnitus. This constant noise in the ears is mostly described as a whistling sound, but can also take the form of a buzzing, whooshing or rattling. It cannot be measured but is proven to lead to psychological problems and even suicide.
There are many attempts for therapy but no guarantees for a successful cure. Tinnitus is not only caused by noise but also by stress, middle ear infection, and decreased blood flow to the inner ear or some medications. Often these symptoms are ignored, because they aren't very obvious at first and they have a very slow progression.

Protect yourself, your employees and your relatives with INFIELD customised hearing protection.

Self protection period

Another crucial factor is the duration for which one is exposed to noise. The human ear has a kind of "self-protection", comparable to the self-protection of the skin against the sun's harmful rays. This allows us to be exposed to a noise level of 80 dB for about eight hours without being damaged. A small increase in the noise level to 83 dB, reduces this duration by half, to only four hours. The course of this phenomenon can be seen in the image opposite.
So if one is regularly exposed for long periods of time in environments with noise levels in excess of 80dB, ear protection is essential to prevent permanent damage.



Self protection acceptance

Frequency analysis

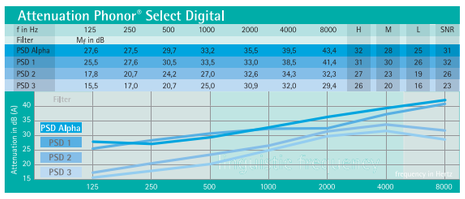
Analysis of Individual Noise Situation

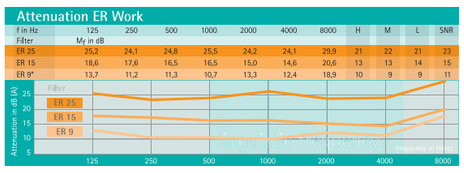
For optimum protection, detailed knowledge of the users work environment is needed. Noise within manufacturing is not only generated by the machines in use but also many other background noises with different frequencies. Specialists have fixed 1000Hz as the standard frequency; this is the lower range of the human voice. INFIELD's frequency analysis always refers to 1000Hz as well as six other frequencies. Three of these frequencies are higher in octave steps; three are at lower octave steps.
The fixed frequencies are 125, 250, 500, 1000, 2000, 4000 and 8000Hz. Please note that a comprehensive frequency analysis is a sign of professionalism and quality of service.
In the frequency based tables for noise reduction you find a lot of numbers. We would like to explain these to you. Now that you are familiar with how these frequencies have been chosen, we'll explain more about the individual numbers.

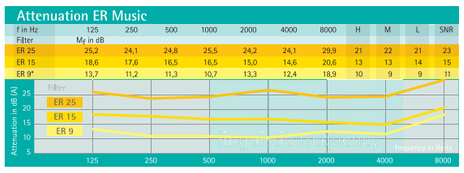
Frequency analysis jargon

Frequency (Hz)	125	250	500	1000	2000	4000	8000
APVf (dB)	5	8	10	12	12	12	12

Legislated APVs for the CE-Mark







Frequency table in original size: Pages 4-7

The APV (Assumed Protection Value) is measured in Decibels (dB). The CE-mark is only issued for hearing protection if this value is above legislated level.

The Mf–value (in dB), determines the mean attenuation of a frequency. For example 25dB at 500Hz means a noise reduction of 25dB at the frequency of 500Hz.

The Sf–value (in dB) is an assumed standard deviation that contributes towards the determination of the APV.

The SNR–value is the mean attenuation for the complete analysed spectrum of frequencies, i.e. from 125- 8000Hz.

The H/M/L–values are the mean attenuation in the respective areas of frequencies.
H = High frequency (2000 - 8000 Hz)
M = Medium frequency (500 - 2000 Hz)
L = Low frequency (125 - 500 Hz)

The graphs illustrate the attenuation that is achieved by the individual filters. Customised hearing protection provides attenuation that is evenly balanced across the relevant spectrum of frequencies in contrast to standard hearing protection.

Laws and Regulations

First of all, the term 'noise' needs to be defined. Legislation describes it as 'any type of sound that disturbs, bothers or damages the health of people, i.e. all sounds that compromise physical, mental and social well-being'.

According to EU guidelines (2006) the following applies:
- at 80dB or above – Hearing protection has to be provided.
- at 85dB or above – Hearing protection must be worn.

Within Europe, all hearing protection products must conform to the appropriate CE standard. Custom Made Hearing Protection comes under the category PPE (Personal Protective Equipment) and must comply with the following standards:
• EN 352-2:2002: Hearing protection – Ear plugs
• EN 352-6:2002: Hearing protection with electrical audio input

The standards were completed in 2003 with new classifications:
• EN 13819-1: Individual Hearing Protection: Physical test methods
• EN 13819-2: Individual Hearing Protection: Acoustic test methods
• The old 352-series is limited to the specific demands that are set by delivery conditions and guidelines

Positive - List of Infield Otoplastics

Type of marking	Usage Limits [db(A)] H M	L	Operations Instructions [db(A)] H M	L	Notes	
ER Music ER15	95	96	80 - 90	81 - 91	S V W E	
ER Music ER25	104	103	89 - 99	88 - 98	S V W E	
ER Work ER15	95	96	80 - 90	81 - 91	S V W E	
ER Work ER25	104	103	89 - 99	88 - 98	S V W E	
Phonor Select 1	106	103	91 - 101	88 - 98	S V W	*
Phonor Select 2	104	100	89 - 99	85 - 95	W	*
Phonor Select 3	99	93	84 - 94	78 - 88		*
Phonor Select alpha	106	104	91 - 101	89 - 99	S V W E	
Phonor Select Digital 1	112	108	97 - 107	93 - 103	S V W	
Phonor Select Digital 2	105	101	90 - 100	86 - 96	W	
Phonor Select Digital 3	102	98	87 - 97	83 - 93		
Phonor Select Digital alpha	110	107	95 - 105	92 - 102	S V W	

Description:
H M = High / Medium frequency noise (L_C - L_A < 5 dB), HML verified according to EN 458
L = Low frequency noise (L_C - L_A > 5 dB), HML verified according to EN 458
S = Audible signals in railway construction are discernible
V = Audible signals for vehicle drivers in road traffic conditions are discernible
W = Meets the criteria for 'General warning signals', 'Informative noises' and 'Voice comprehension'
E = Audible signals for shunting and mainline railway locomotive drivers are discernible
* = The hearing protectors were tested and/or certified by the IFA institute.

Hearing protection according to INFIELD

According to usage, INFIELD offer several variants of Otoplastics, available in a range of colours.

- Phonor® Select
- Phonor® Select Digital
- ER Work
- ER Music

Special versions:
All models can be fitted with a tiny metal ball (detection ball). These specialised models are mainly of interest to the food and chemical industries. By default, a cord with shirt clip is delivered in Green. It is also available in high visibility Neon Orange or made of difficult flammable material (Yellow) or as a detectable metal woven cord (Black). The shirt clip is also detectable.

Moulding and manufacture

Moulding with the Injector

Emptying out of the plastic mould

Work on the slug

Drilling of the hole for the filter

The ear plug is custom moulded to each user. It consists of the silicone earplug and the acoustic filter itself. Before beginning the manufacturing process, an examination has to be carried out to assess that it is safe to inject the moulding putty into the ear canal. During this examination, excess Cerumen (earwax) or Cerumen plugs should be removed from the ear canal. The moulding is performed according to current best practice for the fitting of hearing aids.The moulding material is a pliable two-component putty based on silicone. This is injected into the ear canal without any noticeable pressure. The moulding process is normally not uncomfortable. The result is a perfect copy of the ear canal and part of the Pinna.
In the next production step, this mould is then used to form the final earpiece. This ensures it fits comfortably into the ear canal. A ventilation hole is drilled into the part that inserts into the ear canal and the appropriate acoustic filter is fitted, specifically tuned to your requirements for noise reduction.

Advantages of individual custom made Hearing protectors

- Customised for perfect fit
- Optimum protection
- Communication is retained
- Filters are individually chosen to suit the working environment.
- Important sounds and signals can still be heard
- Ideal comfort, hardly noticeable
- High user acceptance
- Easy to wear with other items of PPE
- Easy to fit
- Easy to clean
- Many applications. For example: metal industry, car manufacture, printing industry, cement works, food industry, chemical industry, woodworking industry, bottling plants and motor sports.

Material and Maintenance

Material
All ear protectors are made from a soft, flexible material. Their mechanical and chemical stability assures a long service life. The Phonor® Select can also be made digitally in UV polymerizate material.
INFIELD hearing protection has the considerable advantage that it does not cause any feeling of pressure in the ear canal, even after hours of wearing. By default, all types are manufactured in transparent materials. The otoplastics can be specified in the signal colours Red, Blue or Yellow.

Maintenance
No special treatment products are required. Cleaning with water is sufficient.

Service and Guarantee

Service
We offer comprehensive consultation and aftercare. Please contact us directly for general information and individual queries.

Guarantee
INFIELD hearing protection products are of high quality and can last many years with the appropriate care. We offer a 2 year warranty on fit and protection.

Testing of Attenuation Values

Infield safety provides with their hearing protectors guaranteed Insulation values. The individual products have cleared the Type Test according to EN 352-2:2-2002 in the PZT GmbH, Wilhelmshaven and is CE-certified (CE 1974)